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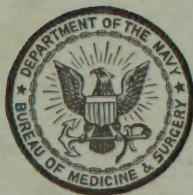


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**FIRST AID TREATMENT
FOR
SURVIVORS
OF
DISASTERS AT SEA**



**Issued By
THE BUREAU OF MEDICINE AND SURGERY
NAVY DEPARTMENT
1943**

HANDBOOK OF FIRST AID TREATMENT FOR SURVIVORS OF DISASTERS AT SEA

U.S.

Issued By
The Bureau of Medicine and Surgery
Navy Department



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PREFACE

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BUREAU OF MEDICINE AND SURGERY

Washington, D. C., April 1, 1943

First Aid Treatment for Survivors of Disasters at Sea is published for use by all Navy, Coast Guard, and Merchant Marine personnel as a guide in giving emergency first-aid treatment to shipwreck survivors. It is recommended that it be given the widest distribution possible, particularly to those ships and stations where "survivors of ship disasters at sea" are likely to be picked up and where there is no medical attention immediately available. A copy should be made a part of the standard equipment for all types of lifeboats and rafts, and a quota based upon complement should be issued to all vessels.

First Aid Treatment for Survivors of Disasters at Sea covers an entirely different field from that to which the usual understanding of "first aid" applies. These procedures are based upon the experiences and needs of 9,114 survivors of 167 ship disasters; the points emphasized are blast and submersion injuries, immersion foot, frostbite, sunburn, eye inflammations, starvation, thirst, and mental disturbances.

ROSS T McINTIRE,
Surgeon General, U. S. Navy.

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FIGURE 1.—Eighty-three days on a raft! Starvation, famine edema, "immersion foot" and sun- and wind-burn affected each survivor. Two other companions died on the raft and were buried at sea.

(III)

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FIRST-AID TREATMENT FOR SURVIVORS OF DISASTERS AT SEA

SECTION I

GENERAL PRINCIPLES

1. Purpose.—This guide has been written to help you in giving first aid to shipwreck survivors before a medical officer can see them. To use this information to the best advantage, you should know the general principles of first aid, and you must know how to give artificial respiration and how to stop hemorrhage—and you must know the first-aid treatment of shock, burns, heat exhaustion, sunstroke, and of fractures.

2. Use of Own Judgment.—You will have to use your own judgment in caring for cases of this kind. No hard-fast rules can be laid down because no two cases are alike and some people can stand up under hardships better than others. Going without food and water may cause much suffering among some survivors whereas others may not suffer greatly. Some persons can withstand exposure to sun, moisture, heat and cold better than others.

3. What To Expect, and To Do.—Do not forget that burns, broken bones, flesh wounds and the condition of shock are found often among survivors. First-aid treatment must be given immediately for these conditions. Another condition called *blast concussion injury* (in water) should be expected in survivors who have been swimming or floating in the water when a depth charge, torpedo, or aerial bomb has exploded nearby. The destructive force of such a blast is transmitted in all directions through the water and it is very likely to cause injuries of the lungs, stomach or intestines.

Because the injuries are internal, they cannot be seen and may be overlooked. However, there are certain symptoms you should watch for and be ready to take immediate action when they appear. Shock may be the first and only symptom, or it may develop after the appearance of other symptoms. If the lungs are injured, the victim will have difficulty in breathing. He may spit up or cough up frothy blood. With injury to the stomach and intestines, the victim will complain of pain in the abdomen. Later, due to the severe internal inflammation, you may find that the belly is swollen or very firm and unyielding. It may feel rigid and board-like when you put your hand on it.

4. Blast Concussion Injury, First-Aid Treatment.—*The first-aid treatment of these conditions due to blast should be given immediately.* The victim should be made to lie down with his head low and he should be kept warm. If you have morphine syrettes, give him sufficient morphine to relieve his pain and keep him comfortable. Water or other fluids may be given if thirst is severe. If you suspect that an internal organ has been ruptured or that there has been internal hemorrhage, there is all the more reason for getting him medical attention promptly.

5. Breathing Hard and Coughing Blood.—In the case of victims who are *breathing hard and coughing blood*, prop them up in a half sitting position and use morphine in small amounts only. Give only one-half the contents of a syrette.

6. Effects of Exposure in Open Boat.—Survivors who have been at sea in an open boat or raft for several days or weeks usually will be suffering from one or more of the following conditions:

- a. Extreme thirst.
- b. Starvation (malnutrition and under-nutrition).

- c. Painful and swollen feet ("Immersion Foot").
- d. Frostbite and effects of prolonged exposure to cold.
- e. Sunburns.
- f. Inflammation of eyes caused by sun glare, oily water, or exposure.
- g. Mental disturbances.

The treatment for each one of these conditions is described separately in this guide. Any one of several or a combination of them, or an injury, may cause shock. Survivors may be so weak that shock will develop unexpectedly when they attempt to climb out of a boat or raft.

7. Carrying and Handling of Survivors.—*The survivors should be carried* from the boat or raft if possible, and no avoidable exertion should be allowed unless you are sure that there are no serious injuries and that the general physical condition is reasonably good. A good rule to follow is to keep the survivors lying down with the head low and the feet raised. After carrying them to a dry and fairly warm place, remove all clothes, but be very careful to handle the legs and feet as gently as possible. Survivors should be warmed up, but never put a hot water bottle or any direct heat against their feet or legs, because permanent damage may result if they have a condition known as "immersion foot." Don't place survivors near a radiator, stove, or anything hot. Keep your patients at rest in a warm bed until all signs of exhaustion, shock, and mental distress have cleared up.

8. Examination of Survivors.—You must examine each survivor carefully for injuries, burns, frostbite, swelling, numbness, paralysis, and unusual tenderness of any part of the body. Ask about pain in the arms and legs.



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FIGURE 2.—Rescued survivors of shipwreck. Note the physical condition of the patients. Stokes stretcher and blankets are shown in use.

a. Comfort and Questions.—After you have made the survivor as comfortable as possible, and if his condition permits, ask him how many days he has spent in an open boat and what the weather was like and if he was injured or sick. Don't forget to ask if he was swimming in the vicinity of an underwater explosion. Find out how much water and food he had and what kind of food rations were at hand. Ask him if he has taken any sea water to drink.

9. Removal of Oil From Skin.—*Shipwreck victims often are covered with a heavy coating of dirty oil.* This happens when a tanker is torpedoed and survivors are forced into oil covered water. The oil can be removed by using another oil such as castor oil, mineral oil, lard, clean diesel oil, or other light oil as a wash and following it by the use of soap and water. On board naval vessels and in naval shore stations a special preparation called "Hypex" is used for this purpose. Also a 5 percent solution of "Dreft," "Drene," or "Orvus" can be used to remove oil. These are the trade names for several commercial cleansing agents. Soap and water must be used afterwards.

10. What To Do for Oil in Eyes, Ears, and Stomach.—If the survivor is covered with a dirty coating of oil, some of it usually gets in his eyes. This causes an eye inflammation. Its treatment is described below in the section called "Eye Inflammation." *Oil that gets in the ears* may cause earache. It can be relieved by gently flushing the ears out with lukewarm water. *Oil that is swallowed* may cause vomiting, diarrhea and abdominal pain. These symptoms disappear quickly with rest in bed and a diet of only soft or liquid foods.

11. Sores on Body, Legs, and Feet.—Survivors who have suffered from severe exposure may have *small sores like boils or ulcers*, covering all parts of the body that are not protected by clothing. Carefully clean the dirt

from the skin and remove the crust from the sores. Treat the sores with an antiseptic. Do not touch the sores on the feet or legs if the condition known as "immersion foot" is present. You will know how to recognize it after reading its description below.

12. Pressure Ulcers and Bed Sores.—Among those who have suffered greatly from starvation, extreme weight loss and emaciation will occur. Pressure ulcers or bed sores may develop from prolonged contact and pressure of the skin against hard surfaces such as thwarts and boat bottoms. Protect the ulcers against further pressure and contact with clothing or bedding by using cotton rings or pads. Do not put the support or padding directly on the ulcer or the surrounding inflamed area. Change the position of the patient frequently by turning him. Cleanse the inflamed areas daily with alcohol and dust with antiseptic powder. Keep the areas clean and dry and do not apply a dressing.

13. Caution About Starting Treatment.—Don't start treating anyone until you have carefully read the treatment for all conditions described in this guide. The treatment of special conditions caused by exposure and lack of food and water will now be taken up.

SECTION II

CARE OF SURVIVORS SUFFERING FROM EXTREME THIRST

14. General Description.—If the victim has been exposed for a long time and has not had enough water, he will be suffering from extreme thirst. Except for shock and serious injuries, extreme thirst causes the greatest suffering and the most deaths among survivors. The treatment of starvation is not important when survivors are dying of thirst.

a. Food and water.—Without food the average man may be expected to live for about twenty-one days if he has water to drink. If he gets less than one pint of water per day, and provided he gets no moist food, he will suffer from thirst after a few days. However, survivors have been known to live for ten days or more on as little as two or three ounces of water per day without causing any apparent bodily damage. The amounts of water and food needed by a survivor depend upon weather conditions, physical exertion and individual resistance.

b. Unconsciousness and shock.—Thirst may be so severe that it causes unconsciousness or extreme shock. Don't give water by mouth in cases of this kind. They should be treated for shock. After recovery from shock, they can usually take small amounts of sweetened water by mouth. It is best not to give alcoholic stimulants to survivors who are in need of water.

15. Treatment of Extreme Thirst.—Do not try to give fresh water or salt water through a rubber tube or other device inserted into the rectum. If shock or unconsciousness cannot be overcome, the immediate attention of a medical officer is necessary. Great loss of weight, high fever, very fast pulse, convulsions and being unable to urinate are symptoms which show that there is serious damage and that prompt medical attention is needed. In most cases, however, small amounts of water can be taken by mouth immediately. If severe thirst is present and there is difficulty in swallowing and a dry mouth, a few ounces of water with sugar added should be given every two hours and the amount should be gradually increased. Use about a teaspoon of sugar to a glass of water. Usually these cases are also suffering from starvation and the feeding of soft and liquid foods will help in providing water. If moderate thirst is present, it is treated by giving the victim all the water

he can comfortably take and as often as he likes. Zinc oxide ointment may be used to treat the lips when dryness has caused cracks and sores.

16. Swelling of Legs Following Treatment.—

After the water balance of the body has been brought back to normal, the survivor's feet and legs may swell. This swelling may be due to (1) "*immersion foot*", (2) *lack of vitamins in the diet*, (3) *lack of meat and other proteins in the diet*. Keep the victim's feet raised above the level of the body until the swelling goes down.

17. Caution About the Use of "Sulfa Drugs".—

You may wish to give one of the sulfa drugs by mouth for the treatment of severe burns or flesh wounds. *Do not give any of the sulfa drugs* until the survivor has had enough water to overcome his thirst. If his thirst is extreme, this may take several days.

18. Note on "Urinating".—Don't be alarmed if, for the first week or more after rescue, the survivor complains of urinating more often than usual.

SECTION III

STARVATION

19. What to Expect.—Most of the survivors after long exposure are suffering from starvation. The effect of starvation is much like that of severe thirst. It may be so severe that unconsciousness or shock will result and no attempt to give food or water by mouth should be made until the shock has been treated. Usually the victims have lost a great deal of weight. They may have fever and breathing may be shallow and fast. Keeping them at rest in a warm bed is of the greatest importance in treating both starvation and extreme thirst. If they have trouble in swallowing, dry mouth, and difficulty in urinating, you must treat them for thirst before giving soft or solid foods.

20. Feeding a Starved Survivor.—*In general, the feeding of starved victims is like feeding a person who is just recovering from a serious illness.* Give them small amounts of easily digestible foods at frequent intervals. For stimulants, give hot tea or coffee with sugar added. Victims who have been starved for three weeks or more and those who have been on a poor diet before shipwreck will usually need *vitamins*. To supply vitamins and fluids, give sweetened fruit juices (fresh orange juice, fresh lemonade, and canned grapefruit juice). The juice from ordinary canned tomatoes may be given and is usually less apt to cause an upset stomach than tomato juice cocktail.

21. Effects Produced by Lack of Vitamins.—*Extreme lack of vitamins* often causes sore mouth, swollen and bleeding gums, ulcers of the eyes, skin troubles, and swollen legs and arms. The sores in the mouth may be very troublesome, causing ulcers and difficulty in eating. Concentrated vitamins (of the kind that contain several vitamins including vitamins B and C) should be given. Two or three times the usual daily dose should be given. Remember that the lack of vitamins is more apt to cause trouble in warm and tropical climates. If you do not have vitamin pills, the treatment for starvation which is described below will help until the victims get medical attention.

22. First, Second, and Third Day of Treatment.—*On the first day of treatment,* give either fresh milk, condensed milk, or canned evaporated milk. Water must be added to the canned milk so that it has about the thickness of fresh milk. Sugar should be added to the fresh milk and evaporated milk, but it need not be added to sweetened condensed milk. Do not give cream or greasy foods for the first few days. Clear soups and broths are good if they do not contain much fat. Gruel, such as oatmeal, cream of wheat, or other well-cooked

cereals with sugar and milk added are good. *Usually on the second day* toast and bread can be added to the victims' diet, and *by the third day* regular full well-balanced meals can ordinarily be given.

23. Nutritional or Famine Edema (dropsy).—A condition known as *nutritional* or *famine edema* (dropsy) may be seen in victims who have been starved for a period of two months or more. It is a result of not getting enough meat and other protein foods. In addition to the starved appearance, there is a swelling of the feet, legs, hands, and arms. To treat such cases give foods having a high protein content, such as eggs or meat. At first, give egg drinks and broth or soups. Try to get such cases under medical attention as soon as possible because they usually need hospital care.

24. Bowel Movements.—Survivors who have been on small food or water rations or without food or water for several days often become alarmed because they have few or no bowel movements. This is to be expected and no first-aid treatment is necessary. However, if desired, for such cases an enema may be given for the treatment of constipation.

SECTION IV

IMMERSION FOOT

25. Cause and Symptoms.—If a survivor has been sitting in an open boat for a long time, his feet are often cold and wet. Actually they may have been immersed in icy water in the bottom of the boat. This causes a condition called "immersion foot." It may develop even though the victim has been wearing shoes or boots. Usually the first thing noticed is painful feet, and then a few days later the feet and legs begin to swell. These first symptoms are much like chilblain, even though the water temperature may have been above freezing. After a time discoloration of the skin appears and blood or

water blisters, ulcers, and even death of the tissues may occur. The feet feel numb and they may become paralyzed. Numbness and tingling sensations may be felt in the arms and hands.

a. Swelling of legs in "starvation" and in "immersion foot."—You have read previously that swelling of the feet and legs may occur with a poor diet, especially if there have not been enough vitamins or enough protein. This condition is different from the swelling of "immersion foot," because in "immersion foot" there is *much pain*, often discoloration of the skin, and the feet are liable to have ulcers or sores on them. These other symptoms are not found usually with the swelling caused by a poor diet.

26. First-aid Treatment of Immersion Foot.—First-aid treatment for "immersion foot" is very important because the vitality of the legs and feet has been lost and the *tissues are easily damaged*. With treatment the circulation of blood in the legs and feet is improved, but remember that too rapid a return of circulation may cause severe pain and further damage. *Be very careful in handling the limbs* while numbness is present to keep from injuring the flesh. Keep the victim's feet and legs raised above his body level and put cold compresses on them for fifteen or twenty minutes out of every hour to relieve the pain. For compresses, use cloths that have been wrung out of cold water. *Do not let the skin get wet*. Use a rubber sheet or layer of other waterproof material to protect the skin from the moisture. Instead of compresses, ice bags may be used if a towel is placed underneath to protect the flesh. An electric fan blowing cool air over the feet may be as comforting as either compresses or ice bags. Keep the rest of the victim's body warm by applying heat. The arms may be placed in hot water to gradually warm him up. *Never put direct heat on a foot or leg*



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FIGURE 3.—“Immersion Foot.” Salt water caused these sores on the legs of an airman rescued by a U. S. destroyer after seven days on a life raft.

of a victim suffering from "immersion foot." Massage is harmful and the legs should not be washed and antiseptic should not be used. If you have sulfanilamide powder, you should dust it into any ulcers, cuts or sores that may be present on the limbs. Place the injured limb or limbs in dry cotton or wool and keep them cool. Don't apply any tight dressings or bandages because they may stop the circulation. You may have to keep up the treatment several days or weeks before the symptoms of "immersion foot" disappear. As long as there is paralysis or swelling or pain, the patient should not be allowed to walk and the treatment should be kept up.

SECTION V

FROSTBITE AND PROLONGED EXPOSURE TO COLD

27. General Description and Care.—Survivors who are in a weakened condition and who are starved are apt to suffer severely from the effects of cold. *When the whole body has been exposed to severe cold* the victim becomes numb, it is difficult for him to move, his eyesight fails, and he may become unconscious. In such a case, carry the patient to a cool room and warm him up very slowly. If breathing has ceased, give artificial respiration. Rub the limbs with cloths wet in cool water. When he begins to come to, give him a warm stimulating drink, such as coffee, tea or cocoa. Also slowly make the room warmer or move him to a warmer room. Then put the patient in a warm bed. If the patient is only chilled and is not unconscious and no parts of his body are frozen, he should be put in a warm bed at once and given hot stimulating drinks.

28. Frostbite.—*Frostbite is the freezing of single parts of the body* most often the nose, ears, cheeks, fingers and toes. Frostbitten hands or feet are usually very painful. Frozen ears, cheeks and nose are not

painful and the victim usually does not realize they are frozen until someone notices the color change and tells him about it.

29. Thawing Out Frozen Parts.—In thawing out frozen parts of the body, *never use heat*. If the parts thaw too fast, pain and swelling result. The skin may peel off leaving a raw surface and there is danger of infection.

30. First (chilblain), Second, and Third Degree Frostbite.—*In first-degree frostbite*, sometimes called *chilblain*, the skin is a dark red color and the part is painful. *In second-degree frostbite*, the skin is bright red and there are blisters. *In third-degree frostbite*, the frozen part is pale, stiff, and brittle.

31. Treatment.—Treatment should be started by putting cold wet cloths on the frosted part. Do not rub snow or ice on it. The temperature of the water in which the cloths are soaked should be raised gradually (a degree or two every few minutes) until it is lukewarm. If there are blisters, do not open them. Stop this treatment when the skin color is normal again and apply boric acid ointment to the frozen areas. Parts that are dead as a result of third-degree frostbite will, of course, not improve with treatment, and gangrene (death of the tissues) will set in. Cases like this need medical attention as soon as possible.

SECTION VI

SUNBURNS

32. Results and Causes.—Sunburn of survivors can be very serious and deaths have resulted from it when large areas of the body have been burned as a result of scanty clothing. Exposure in an uncovered boat or raft can cause sunburn even under a cloudy sky.

A well-tanned skin does not protect always against sunburn.

33. Moderate Sunburn—First-Aid Treatment.—*First-aid treatment for sunburn* is the same as for any burn. *For moderate sunburn* where the skin is reddened and very small blisters appear, use a burn ointment such as tannic acid ointment or boric acid ointment. Use zinc oxide ointment in cases where the skin has begun to crack and peel.

34. Symptoms and Treatment of Severe Sunburn.—*For more severe burns* where large blisters are present, put on boric acid ointment and cover with sterile gauze. If boric acid ointment is not available, use vaseline. Be careful not to open any blisters that have not already broken. Usually fever is present in cases of this kind and in cases where large areas of the body are moderately sunburned. Feverish patients should be kept in bed and drinking water and other fluids should be plentifully given.

SECTION VII

EYE INFLAMMATION

35. Causes of, In Survivors.—Eye inflammation often occurs among survivors. It may be caused by exposure to wind, cold, or salt water; another kind called reflection blindness is caused by exposure to sunlight or sun glare reflected from water, snow, or ice. Eye inflammation is also caused by oil that may get in the eyes when survivors have to swim in oil-covered water.

36. Symptoms of Eye Inflammation.—The symptoms of eye inflammation are about the same whatever the cause. Where oil is the cause, the eyes look oil stained and dirty. Eye inflammation causes the eyes to be red, bloodshot, overflowing with tears, sometimes painful, and there is often a sticky crust on the lids. Looking at a bright light is usually painful to the victim.

37. Treatment of Eye Inflammation.—*Use a 2 per cent baking soda solution or a boric acid solution* to wash out the eyes. The solution should be dropped in the eyes using an eye dropper or medicine dropper. You can make the baking soda solution by adding one level teaspoonful of baking soda to one-half pint of water. If you cannot make up the baking soda solution, use boric acid solution. Cold compresses (ice bags or cloths wrung out of cold water) should be placed over the eyes for 10 minutes out of every hour that the eyes are painful. Don't use the cold compresses if there are ulcers in the eyes, but get medical attention as soon as possible. If you have a supply of clear, clean, mineral oil on hand, use a drop of it in each inflamed eye three or four times per day. Use an eye dropper or medicine dropper to drop it into the eyes. Do not put any bandages or covering over the eyes. Have the victim wear dark glasses until all the inflammation is gone.

SECTION VIII

MENTAL DISTURBANCES

38. Occurrence of, In Survivors.—Mental disturbances are common among survivors as a result of their severe hardships. Such complications are most often seen in victims of middle age or older who are in poor physical condition. Fatigue and exhaustion cause nervousness or depression. When victims are rescued they may be so happy and excited that their minds are temporarily unbalanced. Survivors may become boisterous and very excitable or they may be so depressed that they appear to be unconscious.

39. Require Watching.—If possible, have someone stay with them as long as mental disturbances are present.

40. Delirium and Fever.—When a victim is delirious, it usually shows that he has a fever and is seri-

ously ill. Convulsions and delirium sometimes result when desperate survivors have taken to drinking sea water. People who drink considerable quantities of sea water seldom ever live to tell about it.

41. Treatment.—Survivors must be reassured that “everything is all right,” and that there is nothing to fear. Mental disturbances usually clear up with rest and with treatment for the other conditions described in this guide. You may have to give mild sedatives such as phenobarbital or bromides to help the victims relax and sleep. Rest in bed in a quiet room and sedatives should be provided for several days or weeks when the mental condition is especially serious and slow to improve.

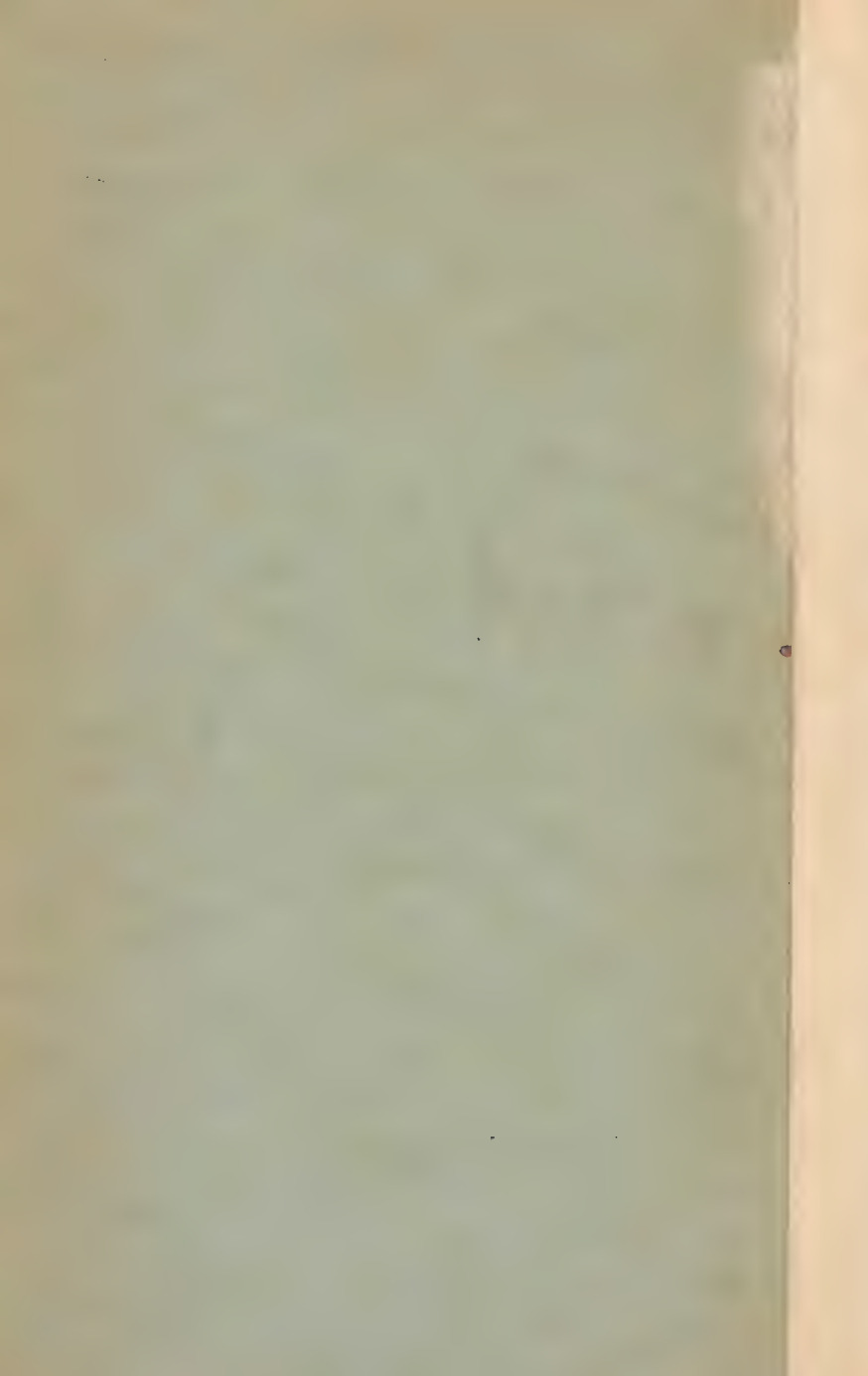
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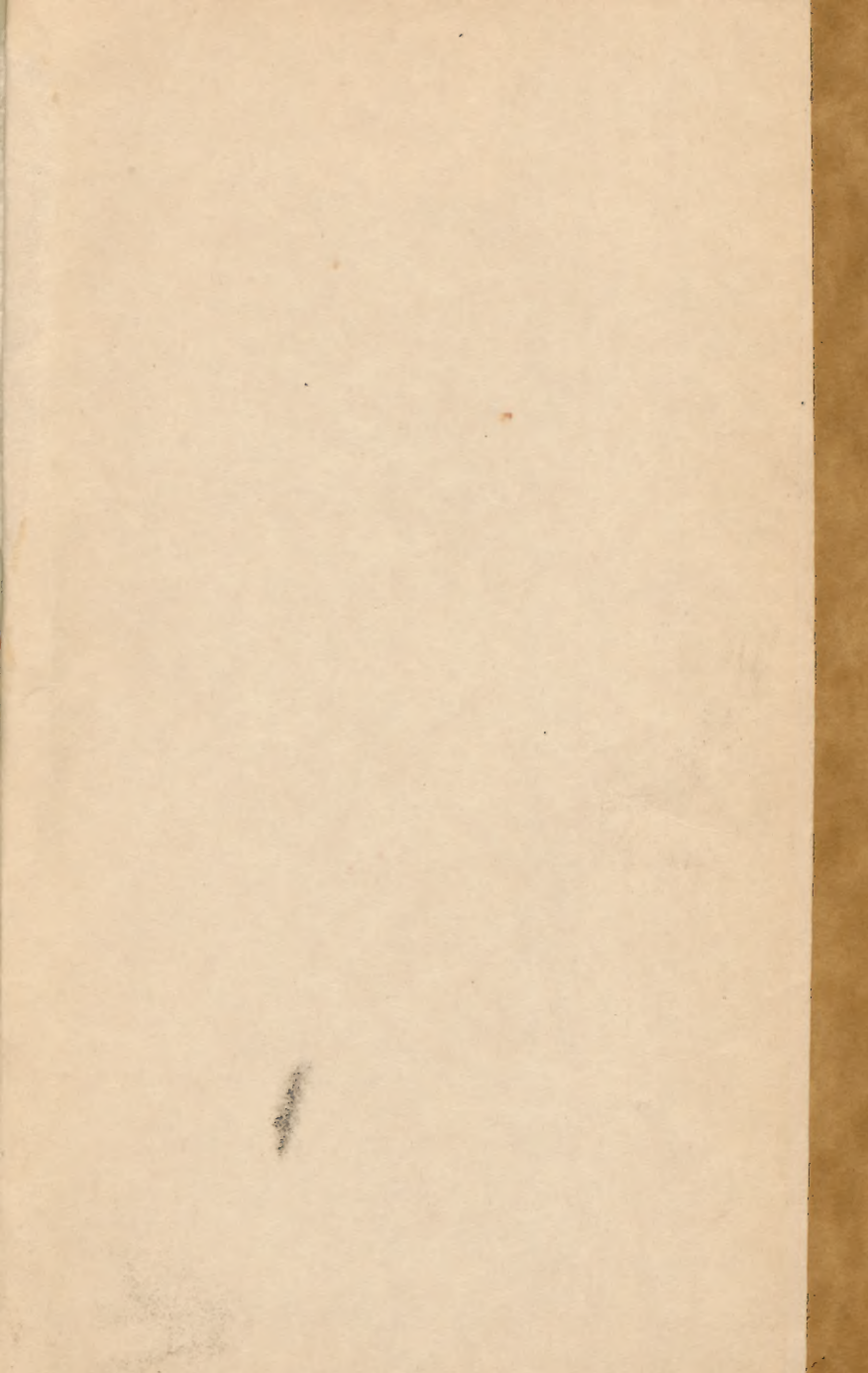
FINAL WORD

42. No Case Is Hopeless.—Remember that recovery is usually rapid and complete in most survivors if they are promptly and properly treated. Don’t think that any case is hopeless even though it may appear to be so. If you follow the directions for treating survivors that you have read above, you will prevent further suffering, start victims on the way to early recovery and you may save a life.











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